

BEST AVAILABLE COPY**REMARKS**

Reconsideration is respectfully requested. Claims 1-29 are in the case. Claims 1-29 stand rejected.

Claim Rejections – 35 USC § 102

The Examiner has rejected claims 1, 13, 25-26, and 28-29 under 35 USC § 102(e) as being anticipated by Sarno et al. U.S. 6,661,664. Applicants respectfully traverse. The claims are not anticipated. It is well settled that "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." See MPEP 2131.

Claim 1 reads as follows:

1. A thermal management apparatus, comprising:
a carrier substrate having a first side and an opposite second side and an opening extending from the first side to the second side;
a protective cover disposed to substantially enclose the first side; and
a thermal conductor dimensioned to fit in the opening to facilitate transfer of heat generated by a first electronic component attached to the first side for dissipation exclusively at the second side.

Claim 13 now reads as follows:

13. A modular platform, comprising:
a shelf;
a plurality of modular platform boards, at least one of the boards including a thermal management apparatus, the thermal management apparatus comprising
a carrier substrate having a first side and an opposite second side and an opening extending from the first side to the second side;
a protective cover disposed to substantially enclose the first side; and
a thermal conductor dimensioned to fit in the opening to facilitate transfer of heat generated by a first electronic component attached to the first side for dissipation exclusively at the second side.

Claim 25 now reads as follows:

25. (Currently amended) A thermal management method, comprising:
providing a carrier substrate having a first side and an opposite second side and an opening extending from the first side to the second side, and a first electronic component coupled to the first side;

- 7 -

Attorney Docket No. 110751-135440
Application No.: 10/748,771

IPN P17972

BEST AVAILABLE COPY

providing a thermal conductor dimensioned to fit in the opening to facilitate transfer of heat generated by a first electronic component attached to the first side for dissipation at the second side;

substantially enclosing the first side with a protective cover; and transferring heat from the electronic component exclusively to the second side via the thermal conductor.

The examiner states:

"Sarno et al. teach a thermal management apparatus 40a, Fig. 4, comprising: a carrier substrate 41 having a first side and an opposite second side and an openings extendings from the first side to the second side, and a protective cover 43 disposed to substantially enclose the first side; and thermal conductors dimensioned to fit in the openings to facilitate transfer of heat generated by a first electronic component attached to the first side for dissipation exclusively at the second side." (Underlining added.)

However, the examiner's analysis of Sarno et al.'s teaching is incorrect. Sarno et al. neither teach nor suggest "openings extendings from the first side to the second side" or "thermal conductors dimensioned to fit in the openings to facilitate transfer of heat generated by a first electronic component attached to the first side for dissipation exclusively at the second side", as set forth in independent claims 1, 13, and 25.

Sarno et al. teach two covers 42 and 43 disposed on opposite sides of a printed circuit board 41, intended to transfer and dissipate heat out from the side each of the the respectives covers are on. Column 3, lines 65, through column 4, line 3, of Sarno et al. teaches "the function of the HTC device 50 is especially to even out or at least greatly reduce the temperature differences presented by a surface with which it is in contact. For this purpose, with the first cover 42 (but also the second cover 43 in the example) being made from aluminum". Clearly it is Sarno et al.'s teaching to dissipate heat from both sides of the printed circuit board 41, and not "for dissipation exclusively at the second side" as required by the claims.

The examiner refers specifically to FIG. 4, however, the Sarno et al. reference is absent any detailed description of FIG. 4 and merely states in column 5 lines 6-8 "FIG. 4 shows an electronic module 40a in the configuration that it would have if the heat

- 8 -

Attorney Docket No. 110751-135440
Application No.: 10/748,771

IPN P17972

BEST AVAILABLE COPY

were to be extracted from the bottom face of the components." When looking to FIG. 4 of the Sarno et al. reference, one skilled in the art would not arrive at applicants' invention as claimed in independent claims 1, 13, or 25, or the claims which depend therefrom. Portions of FIG. 4 may be interpreted by comparing them to the other figures. But, as an example, the following reference numerals, present in FIG. 4, are simply not addressed in the specification: 14b, 12, 82, 75, 48, 82, 75, 48, and 11. Sarno et al. teach a number of layers. From left to right the figure shows: a cover 43, spaced from a second layer 41, which is a printed circuit board, a third layer (for which the specification is completely absent of any description), a fourth layer of a high thermal conductivity or HTC device, and a second cover 42A. As stated, the third layer has no description but appears to be crosshatched as a refractory material. None of the teaching of FIG. 4 would help one skilled in the art to arrive at applicants' invention, and it simply does not include all the elements as claimed.

Sarno et al. make no suggestion to transfer heat generated by an electric component on a first side to the second side, as required by claims 1, 13, 25-26, and 28-29. Further, Sarno et al. do not teach nor suggest a thermal conductor fits into an opening to facilitate transfer of heat from one side to another. In addition, the Examiner has failed to make clear where the supposed openings are.

Therefore, Sarno et al. have clearly not anticipated claims 1, 13, 25-26, and 28-29. Applicants respectfully request the Examiner reconsider the rejection under 35 USC § 102 and allow claims 1, 13, 25-26, and 28-29.

Claim Rejections – 35 USC § 103

The Examiner has rejected claims 1-29 under 35 USC § 103(a) as being unpatentable over Hitoshi JP02003258467A in view of Sarno et al.

The examiner states:

"Hitoshi does not teach said thermal management apparatus comprising a protective cover disposed to substantially enclose the first side, and also said thermal management apparatus being one of modular platform boards located in a shelf of a modular platform. It would have been obvious to one having ordinary skill in the art at the time invention was made to employ a protective cover disposed to substantially enclose the first side in the device by Hitoshi as it is

BEST AVAILABLE COPY

disclosed by Sarno et al. in order to protect said thermal management apparatus for additional heat; and to use thermal management apparatus as one of modular platform boards located in a shelf of a modular platform, as it is also shown by Sarno et al. as a design choice for an intended use. (Underlining added.)

In addition to the examiner's stated shortcomings of Hitoshi, Hitoshi also does not teach, nor suggest "dissipation [of heat] exclusively at the second side", nor does Sarno et al., as discussed.

Respectfully, the Examiner's analysis is faulted in that it does not comply with the obviousness analysis required by Section 103 as interpreted by the Court. It is well settled that in obviousness rejections, the Examiner is to:

- 1) view the invention as a whole,
- 2) identify the difference with the prior art,
- 3) identify those of ordinary skill in the art, and
- 4) determine whether those of ordinary skill in the art will be motivated to make the modification to the prior art to arrive at the claimed invention.

In the instant case, those of ordinary skill in the art would not be motivated by the prior art standing alone to make the modifications necessary to arrive at the claimed invention. Even if such motivation existed, and one skilled in the art were to try and combine these two references, applicants' invention as claimed would not result, as all the limitations, as claimed cannot be found, nor suggested, separately, or in the sum of the references' teachings.

Sarno et al.'s teaching is to include covers on both the top and on the bottom of a printed circuit board. Both covers are made from a thermally conductive material, i.e., aluminum. The substantially symmetrical design, i.e., having two thermally dissipative covers, teaches away from heat dissipation exclusively to one side. It is well settled the

BEST AVAILABLE COPY

examiner is to consider a reference in its entirety. Clearly Sarno et al. make no suggestion of heat "dissipation exclusively at" one side, as required by all of applicants' claims. Hitashi clearly also teaches heat dissipation from both sides. Hitoshi teaches a first heat sink 5 on a first side, and a second heat sink 11 on a second side. Here again there is no suggestion of providing heat "dissipation exclusively at" one side as claimed by applicants.

Furthermore, applicants respectfully note that the Examiner has failed to provide a reference disclosing the deficiencies of the two references discussed. Therefore, the rejection under Section 103(a) appears to be based on facts within the personal knowledge of the examiner. Thus, pursuant to 37 CFR § 1.104(d)(2), applicants respectfully request that the examiner provide an affidavit supporting the unsupported assertions made in the Office Action. Reconsideration of the examiner's rejection and allowance of claims 1-29 is respectfully requested.

The Drawings

The office action mailed May 16, 2006 does not address the replacement drawings filed by the applicants on May 5, 2006. Applicants assume the drawings have been accepted by the Examiner. If such is not the case, the applicants respectfully request the Examiner telephone the undersigned to discuss.

Conclusion

In view of the foregoing, the applicants respectfully submit that claims 1-29 are in condition for allowance. Thus, early issuance of Notice of Allowance is respectfully requested. The Examiner is encouraged to telephone the undersigned if there are any

BEST AVAILABLE COPY

remaining questions of patentability, and a telephone interview would be helpful in resolving these questions.

The Commissioner is hereby authorized to charge shortages or credit overpayments to Deposit Account No. 500393.

Respectfully submitted,

SCHWABE, WILLIAMSON & WYATT, P.C.

Dated: 06/19/2006



Christopher D. Goodman
Registration No. 34,338

Pacwest Center, Suite 1900
1211 SW Fifth Avenue
Portland, Oregon 97204
Telephone: 503-222-9981

- 12 -

Attorney Docket No. 110751-135440
Application No.: 10/748,771

IPN P17972